State of Illinois
Department of Registration and Education
STATE GEOLOGICAL SURVEY DIVISION
John C. Frye, Chief

GUIDE LEAFLET

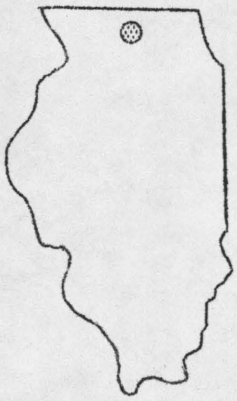
GEOLOGICAL SCIENCE FIELD TRIP

Sponsored by
ILLINOIS STATE GEOLOGICAL SURVEY, URBANA

PECATONICA AREA

Winnebago County

Pecatonica and Rockford Quadrangles



Leader
George M. Wilson
Urbana, Illinois
May 19, 1956

GUIDE LEAFLET 1956C

HOST: Pecatonica High School

PECATONICA GEOLOGICAL SCIENCE FIELD TRIP

Itinerary

Distance	Mileage	
0.0	0.0	Cars face south in front of Pecatonica High School.
0.1	0.1	Turn left. STOP. Highway. Turn left.
0.4	0.5	CAUTION. Three railroad tracks.
0.1	0.6	Cross Pecatonica River.
0.3	0.9	Note the crescent-shaped, abandoned stream channels in the flood plain.
0.2	1.1	Stop 1. View of the flood plain of the Pecatonica River.

The geological features of the flood plain of the Pecatonica River are unusual in that the stream displays features of old age in an area of youthful-mature topography. This anomalous situation was caused by glaciation.

Four periods of glaciation covered Illinois to a greater or lesser extent. These four invasions of ice are the Nebraskan, Kansan, Illinoian and Wisconsinan. Once geologists thought that the third or Illinoian Stage covered the Pecatonica area, but recent studies of the till in this region indicate that glaciation occurred early during the Wisconsinan age.

Melt-water from later invasions of the Wisconsinan Glacier north and east of this area carried great quantities of sand and gravel into the Sugar and Rock valleys. In this region these deposits are found in terraces and dunes. The Pecatonica and Sugar rivers dropped their loads of sand and gravel when their currents were broken upon entering the Rock River. The Pecatonica was partially dammed by these deposits and the reduction of its gradient gave the river its old-age characteristics. During the Wisconsinan glaciation the wind carried silt onto the uplands forming loess deposits. In the fall and winter seasons the valley bottomlands were bare, and the prevailing west winds mantled the countryside with the dust of loess.

0.8	1.9	Leaving flood plain of the Pecatonica River.
0.9	2.8	Stop 2. Till profile.

The soil profile is as follows:

	Ft.	In.
Gray soil and brown loess	0-1	3
Till, chocolate brown to dark brown, clayey	1	
Till, rusty brown and dark brown, sandy, pebbly		9
Till, yellow gray, sandy, pebbly till, calcareous		6

The till here is of earliest Wisconsinan stage, or Farmdale. The loess is of Peorian age.

Evidence shown elsewhere in this area indicates that the glacier over-rolled the geist, or rock residuum.

2.0 4.8 Turn right on Trask Bridge Road.

0.8 5.6 Note the abandoned quarry on the left. This quarry is in the Galena Dolomite, which is indicated by the presence in the lower zone of the sponge Receptaculites, "the sunflower coral."

0.9 6.5 STOP. Rt. 70, then proceed ahead.

0.7 7.2 Note the stone houses on the right and left. The stone is locally derived.

0.8 8.0 Note the excavations in the peat deposits on the right. Such deposits are typical of poorly drained valleys.

0.5 8.5 Stop 3. Platteville Dolomite of Middle Ordovician age.

Some 15 feet of flaggy Platteville Dolomite is exposed here. The fossils indicate the profusion of life that existed in the early Paleozoic seas. Many varieties of bryozoa, gastropods (snails), a giant ostracod called Leperditia, and brachiopods and trilobite fragments occur here.

0.3 8.8 Note the peat bog on the right.

0.4 9.2 SLOW. Turn left on Moate Road.

1.5 10.7 Stop 4. Terrace deposits.

When the glacial melt-waters of Wisconsinan age were flowing through the Sugar River valley and dropped their sand and gravel load, the valley became clogged with sediment. This terrace is a back-fill in the Pecatonica which did not directly receive glacial melt-water. The Pecatonica River was probably a glacial lake during part of this time.

1.0 11.7 Note trench silo on right, and the glacial boulders.

0.5 12.2 STOP. Intersection of Moate and Freeport roads. Turn right.

1.6 13.8 SLOW. Turn left on Winslow road.

0.9 14.7 Stop 5. Quarry in Platteville Dolomite.

Collapse structures have developed along joint planes as a result of solution. In the face of the west wall of the quarry, the upper portion of the stone has become dislodged from the bedrock, which indicates the depth of weathering in this region. Solution may again be responsible for the dislodging.

0.2 14.9 Note the sandy promontories on the left side of the road and on the north side of the hill.

0.5 15.4 CAUTION. Rough bridge. Note the flatness of the valley in this area.

0.5 15.9 CAUTION. Railroad tracks, rough culvert.

0.3 16.2 Turn right.

0.4 16.6 Note the old meander scars of Sugar River.

0.1 16.7 Bridge over Sugar River.

0.1 16.8 Note abandoned quarry in the Platteville Dolomite.

0.1 16.9 Sand dune on left. Excellent example of peat bog on the right.

0.1 17.0 Sand dunes on left.

0.3 17.3 Turn right.

0.1 17.4 Turn left.

0.1 17.5 Note house on right, which is located on sand dune.

0.3 17.8 Dune sand stacked against bedrock ridge on left, making low hills.

0.3 18.1 Stop 6. Quarry in Platteville Dolomite of Ordovician age.

Fossils can be found especially in the blue-gray lower beds in the quarry. Note the widened joints and collapse structures in the quarry face.

The section is as follows:

	Ft.	In.
Platteville Formation		
Magnolia member		
Dolomite, finely crystalline, buff, thin bedded.....	1	0
Dolomite, argillaceous, yellow-buff, chalky to very finely crystalline, medium to thin bedded.....		10
Dolomite, buff, finely crystalline, somewhat fucoidal, deeply weathered.....	1	2
Dolomite, buff, medium crystalline, dense.....		3
Dolomite, buff, finely crystalline, dense, bottom contact very sharp.....	4	1
Limestone, dolomitic, buff, chalky, with strong shale partings.....		7
Limestone, dolomitic, buff, chalky to finely crystalline.....		8
Shale, possibly residual.....		3
Limestone.....		6
Limestone, gray to buff, finely crystalline, with greenish gray shale partings, fossiliferous.....	3	11
Limestone and shale interbedded.....	2	3
Limestone, argillaceous, blue-gray, crystalline.....	6	7
Same as above, but shaly.....	4	6

0.4 18.5 SLOW. Bridge.

0.2 18.7 STOP. Go ahead in Shirland.

0.2 18.9 Turn left at east edge of Shirland.

0.1 19.0 Note glacial erratics on the right side of road.

0.4 19.4 Note glacial erratics on the left.

0.8 20.2 SLOW. Turn left on Forest Preserve road.

0.8 21.0 Note the hummocky surface of the small peat deposit on the right.

1.5 22.5 SLOW. Enter Winnebago County Forest Preserve.

0.2 22.7 Turn right. STOP in front of dining pavilion. Stop 7. Lunch.

0.1 22.8 Leave dining area.

0.1 22.9 Turn right. Follow road leaving park.

0.4 23.3 Dune sand in elongate ridges.

0.3 23.6 Note abandoned quarry on left. Leave park.

2.1 25.7 CAUTION. STOP. Turn left.

1.0 26.7 Turn left on Yale Bridge Road.

0.4 27.1 Sand capped hill on right.

1.4 28.5 Road cut in Platteville Dolomite.

0.2 28.7 Note high sand ridges on right.

0.2 28.9 Note the advancing sand dune on the west side of the barn on the right.

0.4 29.3 SLOW. Enter road materials quarry on right. Stop 8.

The rocks exposed are as follows:

	Ft.	In.
Ordovician System		
Platteville Formation		
Dolomite, coarsely and irregularly bedded	15	
Dolomite, silty, thinly laminated, shaly partings, many Leperditia	5	
Dolomite, sandy, buff	1	½
Glenwood Formation		
Shale, green, medium grained		½
Dolomite, siltstone, greenish gray, moderately fine	1	
Siltstone, medium gray to olive green, fine to medium	2	
Shale, dolomitic, greenish, fine, only slightly calcareous	2	
Dolomite, buff, sandy, hard		3
Sandstone, brown, iron stained, poorly cemented	1	
Sandstone, quite green in upper portion, glauconitic, firm	1	

According to present day interpretation, the sandstone as well as the dolomite are of marine derivation.

0.2 29.5 Leave road material quarry, turn right.

0.1 29.6 Stop 9. Sand dune.

Great quantities of sand were included in the materials left by the melt-waters in the Sugar River. The flood plain lying just west was a sand flat nearly 15 thousand years ago. Since most of the dunes are on the east side of the river valley, geologists surmise that the winds then blew principally from the west as they presently do.

This exposure of a cross-section of a dune was made during the excavation for the fill and approach to the new bridge.

0.2 29.8 Cross Sugar River.

0.1 29.9 Note the accumulation of humus in the sandy soil on the left.

0.2 30.1 Note the ponded meanders on the valley flat.

0.4 30.5 CAUTION. Enter blacktop road, continue ahead.

0.2 30.7 Note the hummocky pasture on the right.

1.0 31.7 STOP. Continue straight ahead.

0.5 32.2 Note the dissection of the hills.

2.1 34.3 STOP. Then turn left (south).

1.7 36.0 Turn left into private lane.

0.3 36.3 Stop 10. Quarry in the Platteville Limestone of Ordovician age.

The section here is as follows:

	Ft.	In.
Platteville Formation		
Magnolia member		
Dolomite, buff, finely crystalline, dense to porous, thin bedded, badly weathered, with rough, finely "sandy" face.....	6	
Dolomite, light buff, medium crystalline, dense to porous, hard, massive, projecting slightly from quarry face; weathered face of unit lighter and smoother than adjacent beds.....		5
Mifflin member		
Dolomite, gray to buff, somewhat argillaceous, very finely to finely crystalline, dense, thin-bedded, with some buff shale partings.....	4	7
Dolomite, buff, finely to medium crystalline, porous, medium bedded, with numerous molluscan molds, face rough, "sandy", slightly projecting....	1	6

	Ft.	In.
Dolomite, argillaceous, chalky, very thin-bedded, very shaly; green-buff, very follliliferous, but with few mollusks; forms a re-entrant in quarry face.....	1	
Dolomite, argillaceous, blue-gray to buff, chalky to finely crystalline, thin-bedded, with gray-green shaly partings; fossiliferous.....	7	
Dolomite, as above, but medium bedded and only moderately shaly.....	1	
Pecatonica member		
Dolomite, blue-gray to buff, finely to medium crystalline, fucoidal, thick bedded.....	11	3
Dolomite, argillaceous, buff, finely crystalline, thin-bedded, shaly.....		6
Dolomite as above, but fossiliferous; prominent bedding break at top and bottom.....		5
Dolomite as above.....		3
Dolomite, moderately argillaceous, blue-gray to buff, crystalline.....	to base.	

Revised August 1963.

GEOLOGIC COLUMN - PECATONICA AREA

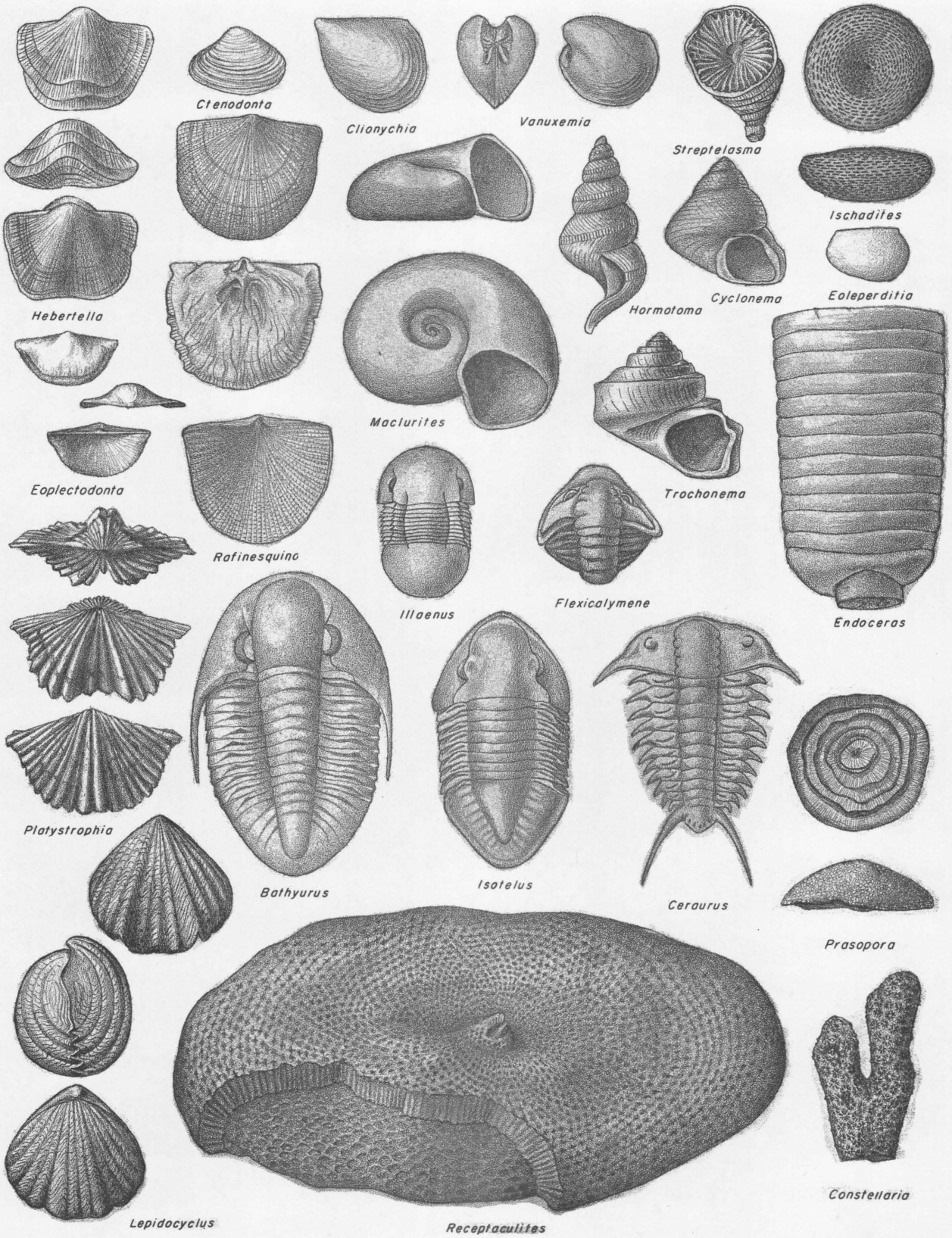
ERAS		PERIODS	EPOCHS	REMARKS
Cenozoic "Recent Life"	Age of Mammals	Quaternary	Pleistocene	Peorian loess Farmdale drift
		Tertiary	Pliocene Miocene Oligocene Eocene Paleocene	Interval of erosion
Mesozoic "Middle Life"	Age of Reptiles	Cretaceous		Present only in extreme southern Illinois
		Jurassic		Not present in Illinois
		Triassic		Not present in Illinois
Paleozoic "Ancient Life"	Amphibians Early Plants	Permian		Not present in Illinois
		Pennsylvanian		Not present in Pecatonica area
		Mississippian		Not present in Pecatonica area
	Age of Fishes	Devonian		Not present in Pecatonica area
	Age of Invertebrates	Silurian	Cayugan	Not present in this area
			Niagaran	Not present in Pecatonica area
			Alexandrian	Not present in Pecatonica area
		Ordovician	Cincinnatian	Maquoketa Shale and shaly limestone. Not present in Pecatonica area
			Mohawkian	Galena Dolomite Decorah Dolomite Platteville Dolomite Glenwood Sandstone, Shale, and Dolomite
			Chazyan	St. Peter Sandstone
			Prairie du Chien	Shakopee Dolomite Oneota Dolomite in wells
		Cambrian		In deep wells only
Proterozoic Archeozoic		Referred to as "Precambrian" time		In deep wells only

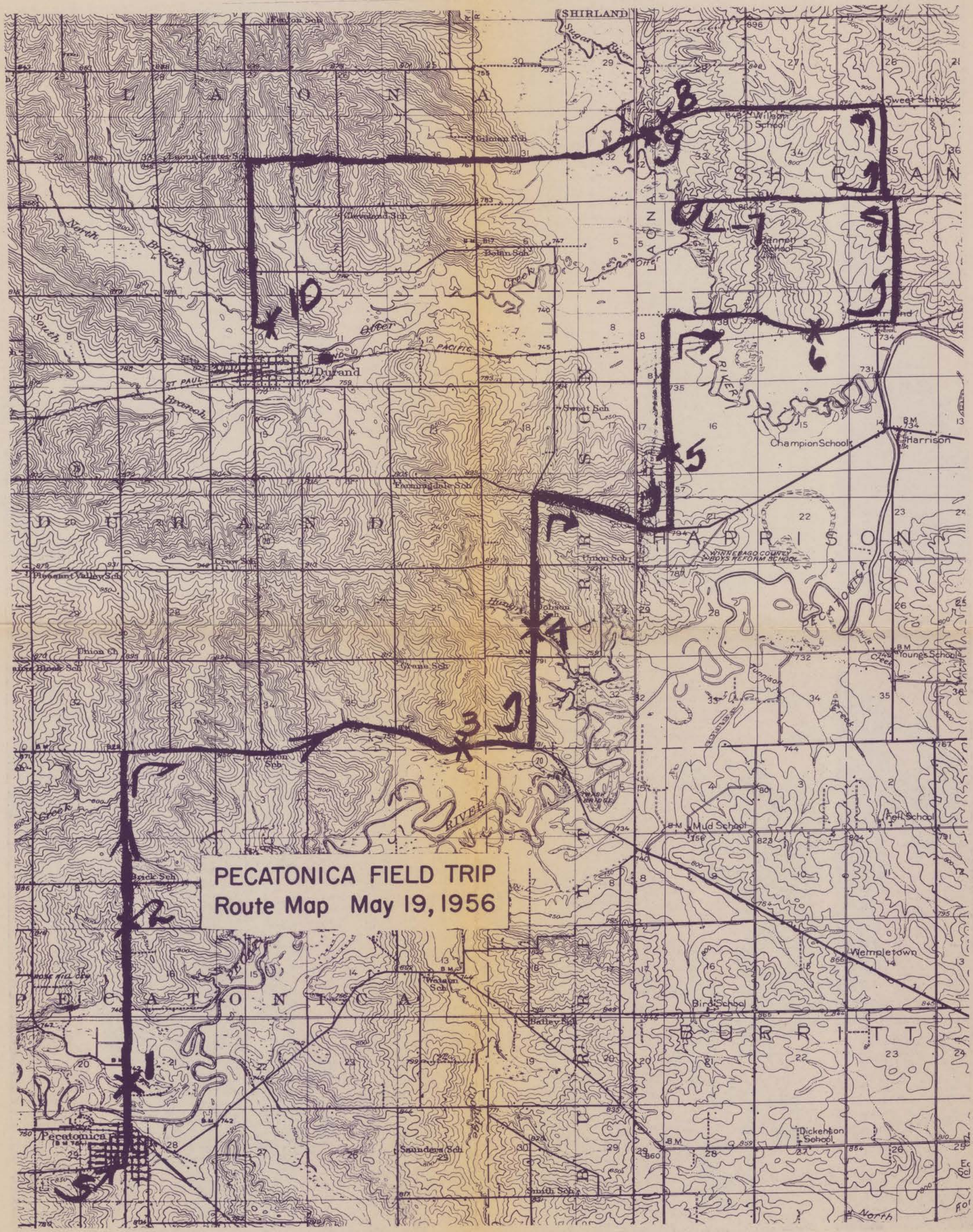
TIME TABLE OF PLEISTOCENE GLACIATION

STAGE	SUBSTAGE	NATURE OF DEPOSITS	SPECIAL FEATURES
HOLOCENE	Years Before Present	Soil, youthful profile of weathering, lake and river deposits, dunes, peat	
	7,000		
WISCONSINAN (4th glacial)	Valderan	Outwash, lake deposits	Outwash along Mississippi Valley
	11,000		
	Twocreekan	Peat and alluvium	Ice withdrawal, erosion
	12,500		
	Woodfordian	Drift, loess, dunes, lake deposits	Glaciation; building of many moraines as far south as Shelbyville; extensive valley trains, outwash plains, and lakes
	22,000		
	Farmdalian	Soil, silt, and peat	Ice withdrawal, weathering, and erosion
	28,000		
	Altonian	Drift, loess	Glaciation in northern Illinois, valley trains along major rivers
	75,000		
SANGAMONIAN (3rd interglacial)		Soil, mature profile of weathering	
	175,000		
ILLINOIAN (3rd glacial)	Jubileean	Drift, loess	Glaciers from northeast at maximum reached Mississippi River and nearly to southern tip of Illinois
	Monican	Drift, loess	
	Liman	Drift, loess	
	300,000		
YARMOUTHIAN (2nd interglacial)		Soil, mature profile of weathering	
	600,000		
KANSAN (2nd glacial)		Drift, loess	Glaciers from northeast and northwest covered much of state
	700,000		
AFTONIAN (1st interglacial)		Soil, mature profile of weathering	
	900,000		
NEBRASKAN (1st glacial)		Drift	Glaciers from northwest invaded western Illinois
	1,200,000 or more		

(Illinois State Geological Survey, 1973)

ORDOVICIAN FOSSILS




PECATONICA FIELD TRIP
Route Map May 19, 1956
SHIRLAND
Sugar River
Fenton Sch
Gilman Sch
Cleveland Sch
Dolan Sch
Durand
PACIFIC
ST PAUL
Branch
North
South
Otter
Creek
RIVER
Sweet Sch
Farmingdale Sch
Union Sch
Pleasant Valley Sch
Hardy
Dobson Sch
Crane Sch
Lemon Sch
Brick Sch
Watson Sch
Bailey Sch
Saunders Sch
Smith Sch
Pecatonica
Rose Hill Cem
Sweet School
Wilson School
Hannen School
Champion School
Harrison
WINNEBAGO COUNTY BOYS REFORM SCHOOL
Tonnison Creek
Youngs School
Mud School
Bird School
Dickenson School
Wemple town
North
LAONA
SHIRLAND
DURAND
HARRISON
PECATONICA
BURRITT